Copper Exceedances Investigation

7 Cedars Public Water System

Jamestown S'Klallam Tribe

May 21, 2014

James Earl, P.E.
Tribal Utility Consultant
Indian Health Service
Spokane District Office
528 E Spokane Falls Blvd Suite #302
Spokane, Washington 99202
(509) 455-3561

TABLE OF CONTENTS

Findings

The 7 Cedars water system currently uses a proprietary treatment system to remove iron and manganese. The treatment system was manufactured by Eco Smarte and uses electronic oxidation, copper ionization and filtration to reduce iron and manganese. Please see Appendix A for Eco Smarte literature. The treatment process uses charged platinum and copper electrodes with intermediate filtration. After the Eco Smarte system was installed, potassium permanganate addition was added upstream of the Eco Smarte system. The reason for adding the potassium permanganate is not known. The Eco Smarte literature does not indicate that potassium permanganate addition is a part of the treatment process as originally designed.

A telephone interview with Eco Smarte technical assistance staff on May 20th indicated that potassium permanganate addition was not compatible or recommended. The technical assistance staff also indicated that the potassium permanganate could be dissolving the copper from the electrodes and contributing to elevated copper levels.

The technical staff went on to state that part of the treatment technology of the Eco Smarte system is to elevate dissolved copper levels to help discourage the growth of pathogens; however, the treatment system is designed to keep the copper levels well below the EPA action level of 1.3 mg/L. The Eco Smarte literature indicates that the maximum expected copper level as a result of their treatment technology is about 0.7 mg/L. The technical staff indicated that copper levels above 0.7 mg/L could be a result of the action of the potassium permanganate on the copper electrodes.

Historical sampling data was examined for elevated copper levels. The Eco Smarte treatment system was operational during this historical period. System entry point samples indicated elevated copper levels in November 2010, June 2011, and December 2013 of 1.01 mg/L, 1.17 mg/L, and 0.29 mg/L respectively. Distribution samples indicated elevated copper levels in April 2006, August 2011, September 2012, October 2012, and December 2013 of 4.85 mg/L, 3.50 mg/L, 3.78 mg/L, 2.70 mg/L, and 2.37 mg/L respectively. Please see Appendix B for historical sample data.

The current groundwater well that provides water to the 7 Cedars Casino was identified as a significant deficiency on the last sanitary survey due to not meeting EPA standards for construction and sanitary control. 7 Cedars Casino management is planning on discontinuing use of the current source and connecting to the Enterprise Lane well, an existing alternate source located near the casino complex.

The following field pH measurements were taken on April 22, 2014 using a Hach HQ40D pH Probe:

Current well source raw water: 7.0
Finished water: 7.13
Proposed Enterprise Lane well raw water: 6.88

Water quality parameter (WQP) testing was conducted on April 22, 2014 for the current source raw and finished water, and for the raw water of the proposed Enterprise Lane well. An

inorganic contaminant (IOC) test panel was also conducted for the proposed Enterprise Lane well. WQP and IOC test results are shown in Appendix C. Alkalinity and pH for the current source raw water was 264 mg/L and 6.97 and the finished water yielded results of 263 mg/L and 6.94, respectively. For the Enterprise Lane well the alkalinity and pH were 87.7 mg/L and 6.88, respectively. The IOC panel for the Enterprise Lane well indicated that hardness was 85.6 mg/L, iron was < (0.1) mg/L and manganese was 0.047 mg/L.

The Eco Smarte treatment system is being maintained by Blue Line Water (Sumner/Puyallup area) Chris Lee (253) 841-2101.

Conclusions

Based on conversations with Eco Smarte and the fact that potassium permanganate is a strong oxidizer, the addition of potassium permanganate into the treatment process could be dissolving the copper electrodes contained in the treatment system and causing elevated copper levels in the finished source water. The piping from the well and in the Eco Smarte treatment process is polyvinyl chloride (PVC), so these areas can be ruled out as a source of copper.

However, historical data indicates the highest copper levels were found in the distribution system, which would indicate corrosion of plumbing piping and fixtures containing copper is occurring. The EPA's Revised Guidance Manual for Selecting Lead and Copper Control Strategies states that water with a pH less than 7.8 and an alkalinity greater than 100 mg/L is frequently highly corrosive toward copper. The alkalinity of the current source is 264 mg/L and the pH is 6.94; therefore, the current source water is likely causing corrosion of copper-containing plumbing materials, thereby causing the elevated copper levels in the distribution samples.

The alkalinity of the proposed Enterprise Lane well source is 85.6 mg/L, which is favorable based on the EPA guideline for alkalinity of 100 mg/L or less to limit copper corrosion. The iron and manganese levels in the Enterprise Lane well are low enough that treatment may not be necessary for this source water.

Recommendations

The addition of potassium permanganate should be discontinued due to the potential for corroding the copper electrodes in the Eco Smarte treatment system. If, after discontinuing the potassium permanganate addition, iron and manganese levels are unacceptable from the current source water, Eco Smarte should be consulted to identify a potential malfunction of the treatment system. Eco Smarte stated that the treatment system has sufficient capacity to reduce iron and manganese levels adequately without the addition of potassium permanganate.

The IOC test panel performed in April 2014 indicates the iron and manganese levels in the Enterprise Lane well are low enough that treatment may not be required. It is recommended that the Enterprise Lane well be chlorinated to provide for an additional barrier to contamination by pathogens.

The current groundwater well was identified as having significant deficiencies on a recent sanitary survey due to not meeting EPA standards for construction and sanitary protection due to its location in a subsurface pit. Therefore, it is recommended that the Enterprise Lane well be considered as a replacement source after the additional water quality testing performed on April 22, 2014 is thoroughly evaluated. WQP testing indicates that the water produced by the Enterprise Lane well would not be corrosive to copper due to much lower alkalinity than the current source. Another benefit of connecting to the Enterprise Lane well is that the IOC panel indicates a much lower level of iron and manganese than the current well. The levels of iron and manganese may be low enough that treatment may not be required. This could represent a significant cost savings by not having to operate and maintain an iron and manganese treatment system.

Several improvements will need to be performed on the Enterprise Lane well to meet EPA standards if the system owners choose to use it as their source well. The casing is too short, so it will need to be extended to a minimum of 18 inches above the surface of the slab. The well cap needs to have an approved screened vent installed. EPA guidance for well casing length and approved well caps is attached in Appendix D.

Please feel free to contact me if you have any questions or if you require additional assistance.

James Earl, P.E.

Appendix A: Eco Smarte Treatment System Literature

The contaminants addressed by Ecosmarte are not necessarily in your water.

ZERO:SALT ZERO:CHLORINE

WELL WATER TURBO and Commercial System

Technology from Apollo lunar missions, ECOsmarte is the world leader in rainwater treatment with residual bacteria control and fine filtered water.

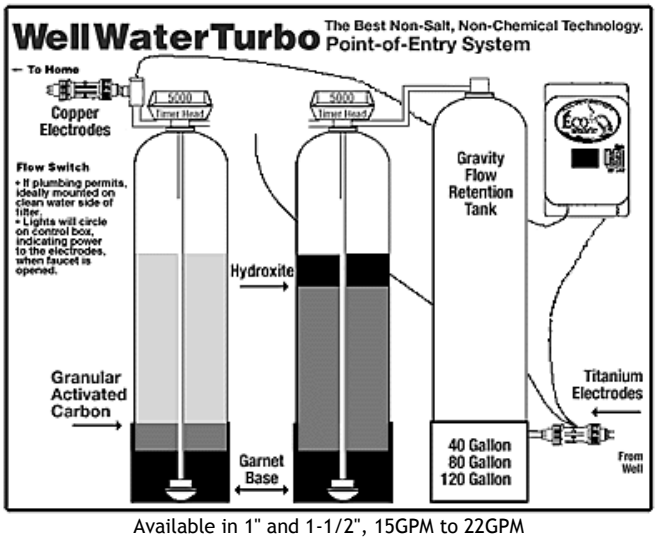
ALL OF YOUR WATER
Indoor, Outdoor, Hot and Cold

The Benefits of a Softener Without the Negatives

The Best Non-Salt, Non-Chemical Technology at Any Price. The only choice for outdoor water.
140 Item EPA ETL Lab Analysis with every unit.

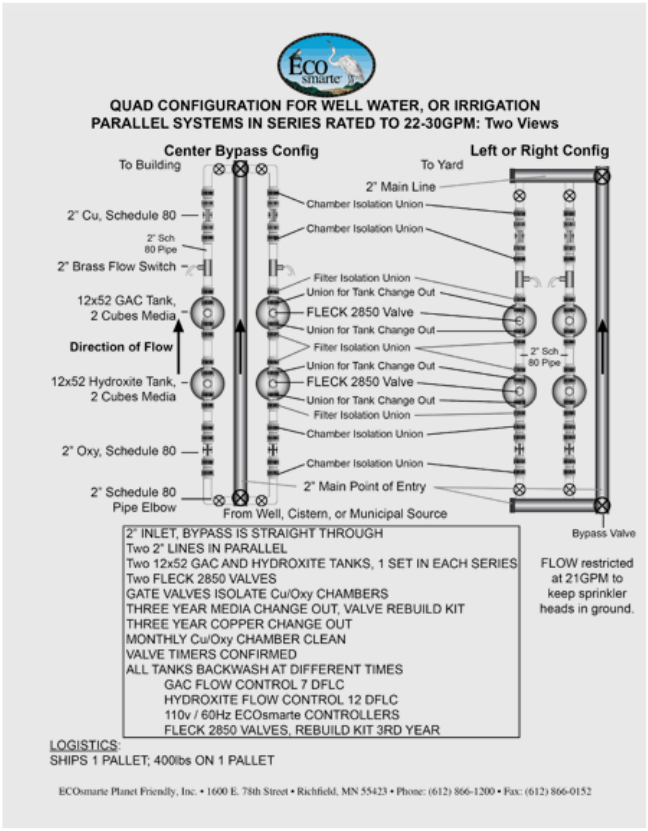
Dual Media, Dual Electrode, Triple Tank System

One million gallon rated activated carbon and hydroxite filter tanks, with automatic timed back wash valves. Dual ionization and oxygen electrodes. System comes equipped with retention tank illustrated below. EPA signature lab test on over 140 items included with every unit sold. Do not purchase equipment from any manufacturer with portable home testing, or from any vendor not offering a money-back guarantee on a major credit card. Why put harmful brine or chemicals into your septic system? 99% of ECOsmarte® well water installs discharge natural water to your drain field.



Available in 1" and 1-1/2", 15GPM to 22GPM

Well Water Turbo Quad
Estate Irrigation



Available in 1" and 1-1/2" valves only

Services 8000 sq. ft., 8 baths, 1 acre, pop up, mist or drip irrigation.

NOTE: The contaminants or other substances removed or reduced by ECOsmarte's Water Treatment Systems are not necessarily in your water.

The ECOsmarte® well water turbo has no equal in point-of-entry water treatment technology. Multiple mineral and chemical problems are addressed across wide ph and flow rate parameters. No salt, chemical regeneration, ph modification or in-line flow restriction is required to deliver premium quality safe water, indoor and outdoor, treated at point-of-entry. Low level ionization residuals remain in plumbing lines for residual protection against bacteria and scale, With technology first developed by NASA on three week Apollo Lunar missions.

IRON/ODOR REMOVAL

Iron/manganese combinations: 6.5 to 9.0 ph
Hydrogen Sulfide: Always
Organic Iron: High Flow Rates

Each well water system comes with a 3 year full warranty with 5 year available, and 99.5% Satisfaction levels have accord on units sold since 1994. Your EPA/ETL lab results will determine whether you need the two or three tank system. Multiple minerals other than calcium above EPA levels, will generally require a three tank configuration.

- Commercial Buildings and Applications
- Science Summary

- Technical Specifications
- Metabolism of Escherichia coli injured by Copper
- Evidence for the Role of Copper in the Injury Process of Coliform Bacteria in Drinking Water

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ECOsmarte® Science Summary

NOTE: The contaminants or other substances removed or reduced by ECOsmarte's Water Treatment Systems are not necessarily in your water.

ECOsmarte® is attempting to patent a group of water treatment technologies using the appropriate combinations of electronic oxidation, copper ionization and specific world class filtration technologies developed by industry leaders.

Electronic Soft Oxidation (Zero Ozone):
Using standard residential current (USA and International 220v 50 cycle; 240v 50 cycle available), ECOsmarte® circuitry transforms the power to low D.C. voltage and low amperage on its titanium electrodes, which have a proprietary noble metals coating. Water contains oxygen in the water molecule itself. OH hydroxyl ion, theoretical atomic oxygen (O_1) and oxygen (O_2) are generated within the sealed pressure line to oxidize the water without using sodium or chemical (the O_2 can be easily confirmed with a D.O. meter). No ozone is generated. 20-80 grams per minute of oxygen radicals are created from the water (at 20 to 2400 gpm flow) and are noted on the following Oxidation Reduction Potential (ORP) Chart, as accepted by most chemistry text books:[1,2,3]

OXIDATION REDUCTION POTENTIAL (ORP) (ECOsmarte® Oxidizers in Bold)		
Chemical	**Symbol**	**OPR Relative Value**
Fluorine	F	2.25
Hydroxyl Radical	●OH	2.05
Atomic Oxygen	O	1.78
Ozone	O^3	1.52
Hydrogen Peroxide	H_2O_2	1.30
Potassium Permanganate	$KMnO_4$	1.22
Hypochlorous Acid	HOCl	1.10
Chlorine (Gas)	Cl_2	1.0
Oxygen	O_2	.94

Sodium Hypochlorite	NaCl	.69
Bromine	Br_2	.57

Each ECOsmarte® oxidizer is more powerful than conventional sodium hypochlorite (bleach), the dominant form of chlorine (12% concentrated sodium hypochlorite or chlorine dioxide would be stronger). The titanium shows no evidence of corrosion, wear or noble metal coating breakdown on installations dating to 1993, and ECOsmarte® includes the titanium electrode pair in the 5 year warranty on the product. Polarity is reversed alternating cathode and anode, allowing for self-cleaning of all ECOsmarte® electrodes.

SPECIFIC TARGET OXIDATION APPLICATIONS
Uric Acid, Bacteria, Virus: Swimming Pool 6.5 pH - 7.4 pH
Iron, Manganese, Hydrogen Sulfide: Well Water 6.4 pH - 8.0 pH
(No chemical regeneration or supplement required.)

The electrodes further oxidize and change the chemical form of sulfides in well water. Specific removal under wide parameters has occurred with hydrogen sulfide, sulpher bacteria and magnesium sulphate. No chemical regeneration of the filter media is required, and it rinses or backwashes with the source water.

- **Copper Ionization:**

ECOsmarte™ uses conventional copper ionization (without silver) in two different ways in its technology (110 CU grade or better.): ECOsmarte® copper electrodes are manufactured in a water soluble, non-chemical or machine oil process.

- **Surface Tension Lowered - "Wetter Water":**

ECOsmarte™ has been confirming lower surface tension of the treated water on sites in numerous applications since 1996.

Surface tension is measured in DYNES with the use of a tensiometer. Untreated water will typically have a surface tension of 72 dynes. The use of wetting agents and surfactants can lower this to between 50 dynes and 60 dynes. Adding ECOsmarte® cells to the install, as well as recirculating tanks can achieve similar results.

- **Soil Moisture Levels Rise:**

On both residential and commercial sites ECOsmarte® has demonstrated significant water savings as the lower surface tension of the water increases the soil moisture within six weeks when measured levels against the soil moisture levels outside of the irrigation zone or on untreated irrigation zone water.

"Wetter water" also develops a more random splash pattern which slows mineral build ups in the soil. (The water droplets are less spherical as surface tension

SGS

Mr Savra Keller
Ecosmarte
PO Box 874
KURANDA QLD 4881

Dear Sir

Re: Laboratory Report No: 49411

Four water samples were produced by the Ecosmarte Ionisation Oxidation Unit at our Laboratory and observed by myself – Jon Dicker. These samples were called Control and 0.18 Cu, 0.44 Cu and 0.70 Cu indicating the times that the samples were run with the Ecosmarte Ionisation Oxidation Unit.

Each sample was tested for our standard suite of analytes in a Potability Certificate, and it was found that for the analytes tested, each sample complied with 2004 NH & MRC Australian Guidelines for Drinking water.

If you have any further queries please do not hesitate to contact the undersigned.

Yours faithfully

SGS Environmental Services

Jon Dicker
Operations Manager

SGS Australia Pty Ltd | Environmental Services Unit 2, 58 Comport Street, Portsmith 4870 QLD Australia www.sgs.com
ABN 44 000 964 278 | t +61 (0) 7 4035 5111 f +61 (0) 7 4035 5122

SGS

CLIENT: Ecosmarte

PROJECT:

Laboratory Report No: 49411

LABORATORY REPORT

Our Reference Your Reference	Units	Australian Drinking Water Guidelines 2004	49411-1 Control	49411-2 0.18 Cu
Chemical Potability				
pH	pH Units	8.5	7.3	7.1
Electrical Conductivity @ 25°C	µS/cm	1500	52	56
TDS (calc)	mg/L	500	30	35
Turbidity	NTU	5	<0.5	<0.5
Bicarbonate Alkalinity as $CaCO_3$	mg/L $CaCO_3$		<5	8
Carbonate Alkalinity as $CaCO_3$	mg/L $CaCO_3$		<5	<5
Chloride, Cl	mg/L	250	9	9
Fluoride, F	mg/L	1.5	<0.05	<0.05
Sulphate, SO_4	mg/L	500	<2	<2
Total Oxidised Nitrogen (as N)	mg/L	11	0.05	0.05
Hardness (equivalent $CaCO_3$)	mg/L $CaCO_3$	200	<5	<5
Silica, SIO3 *	mg/L		13	12
Sodium, Na	mg/L	180	6.3	6.4
Potassium, K	mg/L		0.7	0.9
Calcium, Ca	mg/L		1.1	1.0
Magnesium, Mg	mg/L		<0.5	<0.5
Copper, Cu	mg/L	2	<0.01	0.21
Zinc, Zn	mg/L	3	<0.005	0.005
Iron, Fe	mg/L	0.3	<0.05	<0.05
Manganese, Mn	mg/L	0.5	<0.05	<0.05
Aluminium, Al	mg/L	0.2	<0.05	<0.05
Arsenic, As	mg/L	0.007	<0.005	<0.005
Cadmium, Cd	mg/L	0.002	<0.0002	<0.0002
Lead, Pb	mg/L	0.01	<0.002	<0.002
Chromium, Cr	mg/L	0.05	<0.002	<0.002
Nickel, Ni	mg/L	0.02	<0.002	<0.002
Titanium, Ti #	mg/L		<0.001	<0.001

SGS

CLIENT: Ecosmarte

PROJECT:

Laboratory Report No: 49411

LABORATORY REPORT

Our Reference Your Reference	Units	Australian Drinking Water Guidelines 2004	49411-3 0.44 Cu	49411-4 0.70 Cu
Chemical Potability				
pH	pH Units	8.5	7.2	7.0
Electrical Conductivity @ 25°C	µS/cm	1500	57	53
TDS (calc)	mg/L	500	37	33
Turbidity	NTU	5	<0.5	<0.5
Bicarbonate Alkalinity as $CaCO_3$	mg/L $CaCO_3$		10	8
Carbonate Alkalinity as $CaCO_3$	mg/L $CaCO_3$		<5	<5
Chloride, Cl	mg/L	250	9	8
Fluoride, F	mg/L	1.5	<0.05	<0.05
Sulphate, SO_4	mg/L	500	<2	<2
Total Oxidised Nitrogen (as N)	mg/L	11	0.07	0.06
Hardness (equivalent $CaCO_3$)	mg/L $CaCO_3$	200	<5	<5
Silica, SiO3 *	mg/L		12	12
Sodium, Na	mg/L	180	6.9	6.3
Potassium, K	mg/L		0.7	0.6
Calcium, Ca	mg/L		1.1	0.8
Magnesium, Mg	mg/L		<0.5	<0.5
Copper, Cu	mg/L	2	0.47	0.68
Zinc, Zn	mg/L	3	0.034	0.015
Iron, Fe	mg/L	0.3	<0.05	<0.05
Manganese, Mn	mg/L	0.5	<0.05	<0.05
Aluminium, Al	mg/L	0.2	<0.05	<0.05
Arsenic, As	mg/L	0.007	<0.005	<0.005
Cadmium, Cd	mg/L	0.002	<0.0002	<0.0002
Lead, Pb	mg/L	0.01	<0.002	<0.002
Chromium, Cr	mg/L	0.05	<0.002	<0.002
Nickel, Ni	mg/L	0.02	<0.002	<0.002
Titanium, Ti #	mg/L		<0.001	<0.001

SGS

CLIENT: Ecosmarte

PROJECT:

Laboratory Report No: 49411

LABORATORY REPORT

TEST PARAMETERS	UNITS	LOR	METHOD
Chemical Potability			
pH	pH Units	0.1	CEI-001
Electrical Conductivity @ 25°C	µS/cm	5	CEI-010
TDS (calc)	mg/L	10	APHA
Turbidity	NTU	0.5	CEI-007
Bicarbonate Alkalinity as $CaCO_3$	mg/L $CaCO_3$	5	CEI-012
Carbonate Alkalinity as $CaCO_3$	mg/L $CaCO_3$	5	CEI-012
Chloride, Cl	mg/L	2	CEA-008
Fluoride, F	mg/L	0.05	CEI-048
Sulphate, SO_4	mg/L	2	CEA-009
Total Oxidised Nitrogen (as N)	mg/L	0.05	CEA-001
Hardness (equivalent $CaCO_3$)	mg/L $CaCO_3$	5	CEI-200
Silica, SiO_3 *	mg/L	5	CEI-200
Sodium, Na	mg/L	0.5	CEI-200
Potassium, K	mg/L	0.5	CEI-200
Calcium, Ca	mg/L	0.5	CEI-200
Magnesium, Mg	mg/L	0.5	CEI-200
Copper, Cu	mg/L	0.01	CEI-200
Zinc, Zn	mg/L	0.005	CEI-200
Iron, Fe	mg/L	0.05	CEI-200
Manganese, Mn	mg/L	0.05	CEI-200
Aluminium, Al	mg/L	0.05	CEI-201
Arsenic, As	mg/L	0.005	CEI-201
Cadmium, Cd	mg/L	0.0002	CEI-201
Lead, Pb	mg/L	0.002	CEI-201
Chromium, Cr	mg/L	0.002	CEI-201
Nickel, Ni	mg/L	0.002	CEI-201
Titanium, Ti #	mg/L	0.001	ICP

SGS

CLIENT: Ecosmarte

PROJECT:

Laboratory Report No: 49411

LABORATORY REPORT

NOTES:

LOR - Limit of Reporting.

Where no Guideline is listed, there is no Guideline available to date, except for pH which has a range from pH 6.5 to pH 8.5.

* This test is not covered by our current NATA accreditation.

This analsis determined at Sydney Analytical Laboratories (Seven Hills, NSW), their reference SAL16129, who are NATA accreditated (Accreditation No: 1884) for this parameter.

Appendix B: Historical Sample Data

0108

TWISS ANALYTICAL LABORATORIES, INC.

26280 Twelve Trees Lane, Suite C Poulsbo, WA 98370 Telephone (360) 779-5141 FAX (360) 779-5150

INORGANIC CHEMICALS (IOCS) REPORT FOR LEAD AND COPPER

System ID No:	IH3826	System Name:	Seven Cedars Casino Water System		
DOH Source No:	93	Sample Type:	D	Sample Purpose:	C
Date Received:	4/13/2006	Date Reported:	4/25/2006	Supervisor:	ST
Date Analyzed:		Analyst:		Group:	A
County:	Clallam	Sample Location: *(See Table Below)*			
Send Report To:	Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Bill To:			

DOH #	23 (Copper)	9 (Lead)
State Reporting Level (SRL)	0.2 mg/L	0.002 mg/L
Action Level (AL)	1.3 mg/L	0.015 mg/L
Test Method	EPA 200.7	EPA 200.9

Lab Sample #	Date Collected	Site / Location	Copper mg/l	Lead mg/l
010 50314	4/13/2006	270756 Hwy 101 E CA-08	3.45	0.035
010 50315	4/13/2006	270756 Hwy 101 E CA-09	3.51	0.005
010 50316	4/13/2006	270756 Hwy 101 E CA-10	1.10	0.005
010 50317	4/13/2006	270756 Hwy 101 E CA-11	4.85	0.114
010 50318	4/13/2006	270756 Hwy 101 E CA-12	3.27	0.044

Notes:

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).
FAL: (Federal Action Levels), are 0.015 mg/L for Lead and 1.3 mg/L for Copper. If the concentrations exceed these levels, contact your regional DOH office for further information.
NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.
ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL.
< (0.001): indicates the compound was not detected in the sample at or above the concentration indicated.

Comments:

These are all Sinks in janitorial Closets or hose bibs
Cu action level exceeded 4.18

Twiss Laboratory Number: 65626

TWISS ANALYTICAL LABORATORIES, INC.

26276 Twelve Trees Lane, Suite C Poulsbo, WA 98370 Telephone (360) 779-5141 FAX (360) 779-5150

IOC - LCR

IOC - LCR by EPA Methods 200.9, 200.7

Distribution System - Report of Analysis

IOC - LCR		Group:	A
System ID No:	IH3826 105 200108	System Name:	Seven Cedars Casino
DOH Source No:	S93	County:	Clallam
Sample Purpose:	RC	Date Received:	8/26/2011
		Date Analyzed:	8/30/2011
		Date Reported:	8/31/2011
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Bill To:	Rich Camporini 1033 Old Blyn Hwy Sequim, WA 98382

DOH #	Lead, mg/L	Copper, mg/L
SRL, mg/L	0.001	0.02
Trigger Level, mg/L	--	--
MCL, mg/L	*	*
Analytical Method (Analyst Init.)	EPA 200.9 KW	EPA 200.7 KW

Sample #	Date Collected	Sample Location	Lead, mg/L	Copper, mg/L
01004701	8/26/2011	CA-08 Hosebib Pumphouse	<(0.001)	<(0.02)
01004702	8/26/2011	CA-09 Janitor Closet Downstairs	0.006	3.20
01004703	8/26/2011	CA-10 Janitor Closet Upstairs	0.001	2.56
01004704	8/26/2011	CA-11 Outside Hosebib SE Side	<(0.001)	1.93
01004705	8/26/2011	CA-12 Outside Hosebib SW Side	0.001	3.50

* Lead has not been assigned an MCL, it has an 'Action Level' of 0.015 mg/L designated by EPA. Copper has not been assigned an MCL, it has an 'Action Level' of 1.3 mg/L designated by EPA.

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).

Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.

MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.

ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL.

< (0.00x): indicates the compound was not detected in the sample at or above the concent

Cu action level exceeded 3.35 mg/l

118047

TWISS ANALYTICAL LABORATORIES, INC.
26276 Twelve Trees Lane, Suite C Poulsbo, WA 98370 Telephone (360) 779-5141 FAX (360) 779-5150

IOC - LCR

IOC - LCR by EPA Methods 200.9, 200.7

Distribution System - Report of Analysis

10530108

IOC - LCR		Group:	A
System ID No:	IH3826	System Name:	Seven Cedars Casino
DOH Source No:	S93	County:	Clallam
Sample Purpose:	RC	Date Received:	9/25/2012
		Date Analyzed:	9/27/2012
		Date Reported:	10/3/2012
Send Report To:	Rich Camporini 1033 Old Blyn Hwy Sequim, WA 98382	Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH #	Lead, mg/L	Copper, mg/L
SRL, mg/L	0.001	0.02
Trigger Level, mg/L	--	--
MCL, mg/L	*	*
Analytical Method (Analyst Init.)	EPA 200.9 KW	EPA 200.7 KW

Sample #	Date Collected	Sample Location	Lead, mg/L	Copper, mg/L
01029701	9/25/2012	CA-04 Deli Sink	0.002	0.60
01029702	9/25/2012	CA-03 Main Kitchen Sink	<(0.001)	0.41
01029703	9/25/2012	CA-05 Main Bar Sink	0.006	1.63
01029704	9/25/2012	CA-06 Womens Restroom Sink	0.003	2.17
01029705	9/25/2012	CA-07 Mens Restroom Sink	0.007	3.78

* Lead has not been assigned an MCl, it has an 'Action Level' of 0.015 mg/L designated by EPA. Copper has not been assigned an MCl, it has an 'Action Level' of 1.3 mg/L designated by EPA.
SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).
Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.
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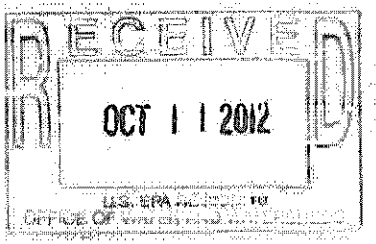
NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.
ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL.
< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.



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TWISS ANALYTICAL LABORATORIES, INC.

26276 Twelve Trees Lane, Suite C Poulsbo, WA 98370 Telephone (360) 779-5141 FAX (360) 779-5150

IOC - LCR

IOC - LCR by EPA Methods 200.9, 200.7

Distribution System - Report of Analysis

10530108

IOC - LCR		Group:	A
System ID No:	IH3826	System Name:	Seven Cedars Casino
DOH Source No:	S93	County:	Clallam
Sample Purpose:	RC	Date Received:	10/2/2012
		Date Analyzed:	10/4/2012
		Date Reported:	10/8/2012
Send Report To:	Rich Camporini 1033 Old Blyn Hwy Sequim, WA 98382	Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH #	Lead, mg/L	Copper, mg/L
SRL, mg/L	0.001	0.02
Trigger Level, mg/L	--	--
MCL, mg/L	*	*
Analytical Method (Analyst Init.)	EPA 200.9 KW	EPA 200.7 KW

Sample #	Date Collected	Sample Location	Lead, mg/L	Copper, mg/L
01050601Ø	10/2/2012	CA-03 Kitchen Sink	<(0.001)	0.359
01050602Ø	10/2/2012	CA-04 Deli sink	[illegible]	0.803
01050603Ø	10/2/2012	CA-05 Main Bar Sink	[illegible]2	1.64
01050604Ø	10/2/2012	CA-06 Womens Restroom Sink	[illegible]3	2.36
01050605Ø	10/2/2012	CA-07 Mens Restroom Sink	[illegible]08	2.70

Cu action level exceeded 2.70 (Sample Collected 9/25/12 & 10/2/12)

* Lead has not been assigned an MCL, it has an 'Action Level' of 0.015 mg/L designated by EPA. Copper has n[illegible]vel' of 1.3 mg/L designated by EPA.

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of H[illegible]

Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this le[illegible] Contact your regional DOH office for further information.

MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.

ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL.

< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.

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IOC - LCR

IOC - LCR by EPA Methods 200.9, 200.7

Distribution System - Report of Analysis

IOC - LCR		Group:	A
System ID No:	IH3826	System Name:	Seven Cedars Casino
DOH Source No:	S93	County:	Clallam
Sample Purpose:	RC	Date Received:	12/18/2013
		Date Analyzed:	12/20/2013
		Date Reported:	12/20/2013
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH #	Lead, mg/L	Copper, mg/L
SRL, mg/L	0.001	0.02
Trigger Level, mg/L	--	--
MCL, mg/L	*	*
Analytical Method (Analyst Init.)	EPA 200.9 KW	EPA 200.7 KW

Sample #	Date Collected	Sample Location	Lead, mg/L	Copper, mg/L
01065901	12/18/2013	CA-03 Kitchen Sink	0.002	0.19
01065902	12/18/2013	CA-04 Deli Sink	0.001	0.07
01065903	12/18/2013	CA-05 Main Bar Sink	0.002	0.74
01065904	12/18/2013	CA-13Rainshadow Bar sink	0.012	0.95
01065905	12/18/2013	CA-14 Back Bar	0.003	2.37

* Lead has not been assigned an MCl, it has an 'Action Level' of 0.015 mg/L designated by EPA. Copper has not been assigned an MCl, it has an 'Action Level' of 1.3 mg/L designated by EPA.

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).

Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.

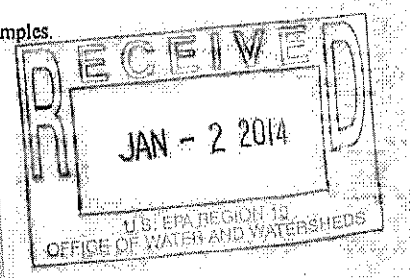
MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact

NA: (Not Analyzed), in the results column indicates this compound was not included in the current analy

ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a l

< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.

Cu action level exceeded 1.66



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INORGANIC CHEMICALS (IOCS) REPORT

System ID No:	IH3826	System Name:	Seven Cedars Casino Water System		
Lab/Sample No:	010,50312	Date Collected:	4/13/2006	DOH Source No:	
Multiple Sources:		Sample Type:	A	Sample Purpose:	C
Date Received:	4/13/2006	Date Reported:	4/27/2006	Supervisor:	ST
Date Prepared:		Date Analyzed:	4/19/2006	Analyst:	NP
County:	Clallam			Group:	A
Sample Location:	CA-02 Finish Water Treatment Rm				
Send Report To:	Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Bill To:			

DOH #	Analytes	Results	Units	SRL	Trigger	MCL	Exceeds		Method / Analyst	
23	Copper	<(0.02)	mg/L	0.2					EPA 200.7	NP

Notes:

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).
Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.
MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.
NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.
ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL
< (0.001): indicates the compound was not detected in the sample at or above the concentration indicated.

Comments:

Please Print Plainly
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WATER MANAGEMENT LABORATORIES INC.
1515 80th St. E.
Tacoma, WA 98404
(253) 531-3121

SEE BACK FOR INSTRUCTIONS

*1,2,3,4

INORGANIC CHEMICALS (IOCS) REPORT

System ID No: IH 3826	System Name: 7 Cedars Casino		
Lab/Sample No: 0892769	Date Collected: 06-10-09	DOH Source No: 002	
Multiple Source Nos: N/A	Sample Type: 13	Sample Purpose: C	
Date Received: 06-11-09	Date Reported: 06-16-09	Supervisor: LHC	
County: Clallam	Date Digested: NA	Group: (A) B Other	
Sample Location: pumphouse hosebib			
Send Results & Bill To: Blue Line Water	Remarks:		
2531 A Inter Ave	AB 3418R		
Puyallup WA 98372			

DOH#	ANALYTES	RESULTS	UNITS	SRL	TRIGGER	MCL	EXCEEDS Trigger?	EXCEEDS MCL?	Method	Analyst
	EPA REGULATED									
4	Arsenic ✓	<0.002	mg/L	0.002	0.05	0.05	NO	NO	200.8	JMB
5	Barium ✓	<0.1	mg/L	0.1	2	2			200.8	JMB
6	Cadmium ✓	<0.002	mg/L	0.002	0.005	0.005			200.8	JMB
7	Chromium ✓	<0.01	mg/L	0.01	0.1	0.1			200.8	JMB
11	Mercury ✓	<0.0005	mg/L	0.0005	0.002	0.002			200.8	JMB
12	Selenium ✓	<0.005	mg/L	0.005	0.05	0.05			200.8	JMB
110	Beryllium ✓	<0.003	mg/L	0.003	0.004	0.004			200.8	JMB
111	Nickel ✓	<0.04	mg/L	0.04	0.1	0.1			200.8	JMB
112	Antimony ✓	<0.005	mg/L	0.005	0.006	0.006			200.8	JMB
113	Thallium ✓	<0.002	mg/L	0.002	0.002	0.002			200.9	JMB
116	Cyanide ✓	<0.05	mg/L	0.05	0.2	0.2			4500-CNF	[illegible]
19	Fluoride ✓	<0.2	mg/L	0.2	2	4			300.0	LHC
114	Nitrite - N ✓	<0.3	mg/L	0.5	0.5	1			300.0	LHC
20	Nitrate - N ✓	0.8	mg/L	0.5	5	10			300.0	LHC
161	Total Nitrate/Nitrite ✓	0.8	mg/L	0.5	5	10	↓	↓	300.0	LHC
	EPA REGULATED (Secondary)									
8	Iron ✓	0.16	mg/L	0.1	0.3	0.3	NO	NO	3111B	JMB
10	Manganese ✓	0.04	mg/L	0.01	0.05	0.05			200.8	JMB
13	Silver ✓	<0.01	mg/L	0.01	0.1	0.1			200.8	JMB
21	Chloride ✓	6	mg/L	20	250	250			300.0	LHC
22	Sulfate ✓	13	mg/L	10	250	250			300.0	LHC
24	Zinc ✓	<0.2	mg/L	0.2	5	5	↓	↓	200.8	JMB
	STATE REGULATED									
14	Sodium ✓	13	mg/L	5					200.8	JMB
15	Hardness ✓	90	mg/L	10					2340C	LHC
16	Conductivity ✓	162	umhos/cm	10	700	700	No	No	2510B	[illegible]
17	Turbidity ✓	1.2	NTU	0.1	1		Yes		2130B	[illegible]
18	Color ✓	<5.0	color units	5	15	15	No	No	2120B	[illegible]
26	Total Dissolved Solids	NA	mg/L	150	500	500	—	—	2540C	—
	STATE UNREGULATED									
9	Lead ✓	<0.002	mg/L	0.002					200.8	JMB
23	Copper ✓	<0.02	mg/L	0.2					200.8	JMB

COMMENTS: FC28 Ammonia Method 4500 NH_3 BAC

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4500-NH3-B

4 Analyte 1003 Nitrogen - Ammonia 4S(N)

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IOC - IOC

IOC - IOC by Various EPA Approved Methods

Source / Point of Entry - Report of Analysis

Date Collected:	11/17/2010	Group:	A
System ID No:	IH3826	System Name:	Seven Cedars Casino
Lab - Sample #:	01089001	County:	Clallam
Sample Location:	CA-02 Finish Water Tap Treatment Room	DOH Source No:	
Sample Purpose:	RC	Date Received:	11/17/2010
Sample Composition:	S	Date Analyzed:	11/18/2010
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	12/8/2010
		Sample Type:	Post-treatment/Finished
		Collected By:	Jeff Becker
		Phone Number:	360-681-4602
		Bill To:	Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
EPA/State Regulated								
4	Arsenic ✓	<(0.003)	mg/L	0.003	0.01	0.01		EPA 200.9 (KW)
5	Barium ✓	<(0.4)	mg/L	0.4	2	2		EPA 200.7 (KW)
6	Cadmium ✓	<(0.002)	mg/L	0.002	0.005	0.005		EPA 200.7 (KW)
7	Chromium ✓	<(0.02)	mg/L	0.02	0.1	0.1		EPA 200.7 (KW)
11	Mercury ✓	<(0.0004)	mg/L	0.0004	0.002	0.002		SM 3112 B (KW)
12	Selenium ✓	<(0.01)	mg/L	0.01	0.05	0.05		EPA 200.9 (KW)
110	Beryllium ✓	<(0.0008)	mg/L	0.0008	0.004	0.004		EPA 200.7 (KW)
111	Nickel ✓	<(0.1)	mg/L	0.1	0.1	0.1		EPA 200.7 (KW)
112	Antimony ✓	<(0.006)	mg/L	0.006	0.006	0.006		EPA 200.9 (KW)
113	Thallium ✓	<(0.002)	mg/L	0.002	0.002	0.002		EPA 200.9 (KW)
116	Cyanide, Total ✓	<(0.1)	mg/L	0.1	0.2	0.2		SM 4500-CN F (JS)
19	Fluoride, F ✓	<(0.5)	mg/L	0.5	2	4		EPA 300.0 (JS)
114	Nitrite-N ✓	<(0.2)	mg/L	0.2	0.5	1		SM 4500-NO2 B (KW)
20	Nitrate-N ✓	5.39	mg/L	2	5	10		SM 4500 NO3 F (KW)
161	Total Nitrate/Nitrite ✓	5.39	mg/L	2	5	10		SM 4500 NO3 F (KW)
8	Iron ✓	<(0.10)	mg/L	0.1	0.3	0.3		EPA 200.7 (KW)
10	Manganese ✓	0.154	mg/L	0.01	0.05	0.05	Yes	EPA 200.7 (KW)
13	Silver ✓	<(0.1)	mg/L	0.1	0.1	0.1		EPA 200.7 (KW)
21	Chloride ✓	66.8	mg/L	20	250	250		EPA 300.0 (JS)
22	Sulfate ✓	<(50)	mg/L	50	250	250		EPA 300.0 (JS)
24	Zinc ✓	<(0.2)	mg/L	0.2	5	5		EPA 200.7 (KW)
14	Sodium ✓	22.4	mg/L	5				EPA 200.7 (KW)
15	Hardness, Total (as CaCO3) ✓	312	g/L as CaCO	10				SM 2340 B (KW)
16	Conductivity ✓	653	µS/cm	70	700	700		SM 2510 B (JS)
17	Turbidity ✓	0.50	NTU	0.1				SM 2130 B (JS)
18	Color ✓	<(15)	PtCo CU	15	15	15		SM 2120 B (JS)
EPA/State Unregulated								
9	Lead ✓	<(0.001)	mg/L	0.001				EPA 200.9 (KW)
23	Copper ✓	1.01	mg/L	0.02				EPA 200.7 (KW)

DEC 16 2010

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93

IOC - IOC

IOC - IOC by Various EPA Approved Methods

Source / Point of Entry - Report of Analysis

Date Collected:	6/13/2011	Group:	A
System ID No:	IH3826	System Name:	Seven Cedars Casino
Lab - Sample #:	01093601	County:	Clallam
Sample Location:	CA-02 Finished Tap	DOH Source No:	
Sample Purpose:	RC	Date Received:	6/13/2011
Sample Composition:	S	Date Analyzed:	6/22/2011
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	6/23/2011
		Sample Type:	Post-treatment/Finished
		Collected By:	Rich Camporini
		Phone Number:	360-681-4602
		Bill To:	Rich Camporini 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
EPA/State Regulated								
4	Arsenic	<(0.003)	mg/L	0.003	0.01	0.01		EPA 200.9 (KW)
5	Barium	<(0.4)	mg/L	0.4	2	2		EPA 200.7 (KW)
6	Cadmium	<(0.002)	mg/L	0.002	0.005	0.005		EPA 200.7 (KW)
7	Chromium	<(0.02)	mg/L	0.02	0.1	0.1		EPA 200.7 (KW)
11	Mercury	<(0.0004)	mg/L	0.0004	0.002	0.002		SM 3112 B (KW)
12	Selenium	<(0.01)	mg/L	0.01	0.05	0.05		EPA 200.9 (KW)
110	Beryllium	<(0.0008)	mg/L	0.0008	0.004	0.004		EPA 200.7 (KW)
111	Nickel	<(0.1)	mg/L	0.1	0.1	0.1		EPA 200.7 (KW)
112	Antimony	<(0.006)	mg/L	0.006	0.006	0.006		EPA 200.9 (KW)
113	Thallium	<(0.002)	mg/L	0.002	0.002	0.002		EPA 200.9 (KW)
116	Cyanide, Total	<(0.1)	mg/L	0.1	0.2	0.2		SM 4500-CN F (JS)
19	Fluoride, F	<(0.5)	mg/L	0.5	2	4		EPA 300.0 (JS)
114	Nitrite-N	<(0.2)	mg/L	0.2	0.5	1		EPA 300.0 (JS)
20	Nitrate-N	5.44	mg/L	2	5	10		EPA 300.0 (JS)
161	Total Nitrate/Nitrite	5.44	mg/L	2	5	10		EPA 300.0 (JS)
8	Iron	<(0.10)	mg/L	0.1	0.3	0.3		EPA 200.7 (KW)
10	Manganese	0.273	mg/L	0.01	0.05	0.05	Yes	EPA 200.7 (KW)
13	Silver	<(0.1)	mg/L	0.1	0.1	0.1		EPA 200.7 (KW)
21	Chloride	47.1	mg/L	20	250	250		EPA 300.0 (JS)
22	Sulfate	<(50)	mg/L	50	250	250		EPA 300.0 (JS)
24	Zinc	<(0.2)	mg/L	0.2	5	5		EPA 200.7 (KW)
14	Sodium	21.4	mg/L	5				EPA 200.7 (KW)
15	Hardness, Total (as CaCO3)	318	mg/L as CaCO	10				SM 2340 B (KW)
16	Conductivity	636	µS/cm	70	700	700		SM 2510 B (JS)
17	Turbidity	0.50	NTU	0.1				SM 2130 B (KW)
18	Color	<(15)	PtCo CU	15	15	15		SM 2120 B (KW)
EPA/State Unregulated								
9	Lead	<(0.001)	mg/L	0.001				EPA 200.9 (KW)
23	Copper	1.17	mg/L	0.02				EPA 200.7 (KW)

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IOC

SB/V

IOC - IOC

IOC - IOC by Various EPA Approved Methods

Source / Point of Entry - Report of Analysis

-108

Date Collected:	12/18/2013	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01066001	County:	Clallam
Sample Location:	CA-02 Finished Water Tap Pump Room	DOH Source No:	
Sample Purpose:	RC	Date Received:	12/18/2013
Sample Composition:	S	Date Analyzed:	12/18/2013
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	12/20/2013
		Sample Type:	Post-treatment/Finished
		Collected By:	Jeff Becker
		Phone Number:	360-681-4602
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
EPA/State Regulated								
4	Arsenic	<(0.0014)	mg/L	0.0014	0.01	0.01		EPA 200.9 (KW)
5	Barium	<(0.1)	mg/L	0.1	2	2		EPA 200.7 (KW)
6	Cadmium	<(0.001)	mg/L	0.001	0.005	0.005		EPA 200.7 (KW)
7	Chromium	<(0.007)	mg/L	0.007	0.1	0.1		EPA 200.7 (KW)
11	Mercury	<(0.0002)	mg/L	0.0002	0.002	0.002		SM 3112 B (KW)
12	Selenium	<(0.002)	mg/L	0.002	0.05	0.05		EPA 200.9 (KW)
110	Beryllium	<(0.0003)	mg/L	0.0003	0.004	0.004		EPA 200.7 (KW)
111	Nickel	0.012	mg/L	0.005				EPA 200.7 (KW)
112	Antimony	<(0.003)	mg/L	0.003	0.006	0.006		EPA 200.9 (KW)
113	Thallium	<(0.001)	mg/L	0.001	0.002	0.002		EPA 200.9 (KW)
116	Cyanide, Free	<(0.025)	mg/L	0.1	0.2	0.2		SM 4500-CN F (KW)
19	Fluoride	<(0.5)	mg/L	0.5	2	4		EPA 300.0 (KW)
114	Nitrite-N	<(0.1)	mg/L	0.1	0.5	1		EPA 300.0 (KW)
20	Nitrate-N	3.18	mg/L	0.5	5	10		EPA 300.0 (KW)
161	Total Nitrate/Nitrite	3.18	mg/L	0.5	5	10		EPA 300.0 (KW)
8	Iron	<(0.1)	mg/L	0.1		0.3		EPA 200.7 (KW)
10	Manganese	0.142	mg/L	0.01		0.05	Yes	EPA 200.7 (KW)
13	Silver	<(0.1)	mg/L	0.1		0.1		EPA 200.7 (KW)
21	Chloride	48.7	mg/L	20		250		EPA 300.0 (KW)
22	Sulfate	<(50)	mg/L	50		250		EPA 300.0 (KW)
24	Zinc	<(0.2)	mg/L	0.2		5		EPA 200.7 (KW)
14	Sodium	22.9	mg/L	5				EPA 200.7 (KW)
15	Hardness, Total (as CaCO3)	328	g/L as CaCO	10				SM 2340 B (KW)
16	Conductivity	669	µS/cm	70		700		SM 2510 B (ST)
17	Turbidity	0.30	NTU	0.1				SM 2130 B (ST)
18	Color	<(15)	CU	15		15		SM 2120 B (ST)
EPA/State Unregulated								
9	Lead	<(0.001)	mg/L	0.001				EPA 200.9 (KW)
23	Copper	0.29	mg/L	0.02				EPA 200.7 (KW)

Appendix C: April 2014 Water Quality Parameter and Inorganic Sample Data

TWISS ANALYTICAL LABORATORIES, INC.

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IOC - SHORT

IOC - SHORT by Various EPA Approved Methods

Source / Point of Entry - Report of Analysis

Date Collected:	4/22/2014	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01020701	County:	Clallam
Sample Location:	Enterprise Lane Well	DOH Source No:	
Sample Purpose:	I	Date Received:	4/22/2014
Sample Composition:	S	Date Analyzed:	4/24/2014
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	5/7/2014
		Sample Type:	Pre-treatment/Raw
		Collected By:	Jeff Becker
		Phone Number:	360-681-4602
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
405	Calcium	16.3	mg/L	0.05				EPA 200.7 (KW)
16	Conductivity	204	µS/cm	70		700		SM 2510 B (ST)
403	Alkalinity	87.7	g/L as CaCO	3				SM 2320 B (ST)
409	pH	6.88 P	pH units					SM 4500-H+ B (ST)

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).
Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.
MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.
NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.
ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL
< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.
* The 0.010 mg/L MCL for Arsenic is for Group A NTNC systems. All other systems should check with their county Health District to determine what level is applicable.

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by Various EPA Approved Methods

Source / Point of Entry - Report of Analysis

Date Collected:	4/22/2014	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01020701	County:	Clallam
Sample Location:	Enterprise Lane Well	DOH Source No:	
Sample Purpose:	I	Date Received:	4/22/2014
Sample Composition:	S	Date Analyzed:	4/22/2014
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	5/7/2014
		Sample Type:	Pre-treatment/Raw
		Collected By:	Jeff Becker
		Phone Number:	360-681-4602
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
	Temperature	15	°C					SM 2550 B (ST)

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).

Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.

MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.

ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL

< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.

* The 0.010 mg/L MCL for Arsenic is for Group A NTNC systems. All other systems should check with their county Health District to determine what level is applicable.

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IOC - SHORT

IOC - SHORT by Various EPA Approved Methods

Source / Point of Entry - Report of Analysis

Date Collected:	4/22/2014	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01020703	County:	Clallam
Sample Location:	CA-01 Raw Water Tap Pumproom	DOH Source No:	
Sample Purpose:	I	Date Received:	4/22/2014
Sample Composition:	S	Date Analyzed:	4/24/2014
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	5/7/2014
		Sample Type:	Pre-treatment/Raw
		Collected By:	Jeff Becker
		Phone Number:	360-681-4602
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
405	Calcium	61.5	mg/L	0.05				EPA 200.7 (KW)
16	Conductivity	643	µS/cm	70		700		SM 2510 B (ST)
403	Alkalinity	264	g/L as CaCO	3				SM 2320 B (ST)
409	pH	6.97 P	pH units					SM 4500-H+ B (ST)

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).
Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.
MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.
NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.
ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL
< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.
* The 0.010 mg/L MCL for Arsenic is for Group A NTNC systems. All other systems should check with their county Health District to determine what level is applicable.

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Source / Point of Entry - Report of Analysis

Date Collected:	4/22/2014	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01020703	County:	Clallam
Sample Location:	CA-01 Raw Water Tap Pumproom	DOH Source No:	
Sample Purpose:	I	Date Received:	4/22/2014
Sample Composition:	S	Date Analyzed:	4/22/2014
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	5/7/2014
		Sample Type:	Pre-treatment/Raw
		Collected By:	Jeff Becker
		Phone Number:	360-681-4602
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
	Temperature	15	°C					SM 2550 B (ST)

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).
Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.
MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.
NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.
ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL
< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.
* The 0.010 mg/L MCL for Arsenic is for Group A NTNC systems. All other systems should check with their county Health District to determine what level is applicable.

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IOC - SHORT

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Source / Point of Entry - Report of Analysis

Date Collected:	4/22/2014	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01020704	County:	Clallam
Sample Location:	CA-01 Finish Tap Pumproom	DOH Source No:	
Sample Purpose:	I	Date Received:	4/22/2014
Sample Composition:	S	Date Analyzed:	4/28/2014
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	5/7/2014
		Sample Type:	Post-treatment/Finished
		Collected By:	Jeff Becker
		Phone Number:	360-681-4602
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
403	Alkalinity	263	ıg/L as CaCO	3				SM 2320 B (ST)
405	Calcium	60.2	mg/L	0.05				EPA 200.7 (KW)
16	Conductivity	648	µS/cm	70		700		SM 2510 B (ST)
409	pH	6.94 P	pH units					SM 4500-H+ B (ST)

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).
Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.
MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.
NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.
ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL
< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.
* The 0.010 mg/L MCL for Arsenic is for Group A NTNC systems. All other systems should check with their county Health District to determine what level is applicable.

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Source / Point of Entry - Report of Analysis

Date Collected:	4/22/2014	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01020704	County:	Clallam
Sample Location:	CA-01 Finish Tap Pumproom	DOH Source No:	
Sample Purpose:	I	Date Received:	4/22/2014
Sample Composition:	S	Date Analyzed:	4/22/2014
Send Report To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	5/7/2014
		Sample Type:	Post-treatment/Finished
		Collected By:	Jeff Becker
		Phone Number:	360-681-4602
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
	Temperature	15	°C					SM 2550 B (ST)

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).

Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.

MCL: (Maximum Contaminant Level), If the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA: (Not Analyzed), in the results column indicates this compound was not included in the current analysis.

ND: (Not Detected), in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the SRL

< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.

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IOC - IOC

IOC - IOC by Various EPA Approved Methods

Source / Point of Entry - Report of Analysis

Date Collected:	4/23/2014	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01022401	County:	Clallam
Sample Location:	Enterprise Lane	DOH Source No:	
Sample Purpose:	I	Date Received:	4/23/2014
Sample Composition:	S	Date Analyzed:	4/23/2014
Send Report To:	Rich Camporini 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	5/6/2014
		Sample Type:	Pre-treatment/Raw
		Collected By:	Rich Camporini
		Phone Number:	360-460-9484
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)
EPA/State Regulated								
4	Arsenic	<(0.0014)	mg/L	0.0014	0.01	0.01		EPA 200.9 (KW)
5	Barium	<(0.1)	mg/L	0.1	2	2		EPA 200.7 (KW)
6	Cadmium	<(0.001)	mg/L	0.001	0.005	0.005		EPA 200.7 (KW)
7	Chromium	<(0.007)	mg/L	0.007	0.1	0.1		EPA 200.7 (KW)
11	Mercury	<(0.0002)	mg/L	0.0002	0.002	0.002		SM 3112 B (KW)
12	Selenium	<(0.002)	mg/L	0.002	0.05	0.05		EPA 200.9 (KW)
110	Beryllium	<(0.0003)	mg/L	0.0003	0.004	0.004		EPA 200.7 (KW)
111	Nickel	<(0.005)	mg/L	0.005				EPA 200.7 (KW)
112	Antimony	<(0.003)	mg/L	0.003	0.006	0.006		EPA 200.9 (KW)
113	Thallium	<(0.001)	mg/L	0.001	0.002	0.002		EPA 200.9 (KW)
116	Cyanide, Free	<(0.025)	mg/L	0.1	0.2	0.2		SM 4500-CN F (KW)
19	Fluoride	<(0.5)	mg/L	0.5	2	4		EPA 300.0 (KW)
114	Nitrite-N	<(0.1)	mg/L	0.1	0.5	1		EPA 300.0 (KW)
20	Nitrate-N	0.89	mg/L	0.5	5	10		EPA 300.0 (KW)
161	Total Nitrate/Nitrite	0.89	mg/L	0.5	5	10		EPA 300.0 (KW)
8	Iron	<(0.1)	mg/L	0.1		0.3		EPA 200.7 (KW)
10	Manganese	0.047	mg/L	0.01		0.05		EPA 200.7 (KW)
13	Silver	<(0.1)	mg/L	0.1		0.1		EPA 200.7 (KW)
21	Chloride	4.78	mg/L	20		250		EPA 300.0 (KW)
22	Sulfate	<(50)	mg/L	50		250		EPA 300.0 (KW)
24	Zinc	<(0.2)	mg/L	0.2		5		EPA 200.7 (KW)
14	Sodium	14.1	mg/L	5				EPA 200.7 (KW)
15	Hardness, Total (as CaCO3)	85.6	ıg/L as CaCO	10				SM 2340 B (KW)
16	Conductivity	215	µS/cm	70		700		SM 2510 B (ST)
17	Turbidity	0.05	NTU	0.1				SM 2130 B (ST)
18	Color	<(15)	CU	15		15		SM 2120 B (ST)
EPA/State Unregulated								
9	Lead	<(0.001)	mg/L	0.001				EPA 200.9 (KW)
23	Copper	<(0.02)	mg/L	0.02				EPA 200.7 (KW)

140224

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IOC - IOC

IOC - IOC by Various EPA Approved Methods

Source / Point of Entry - Report of Analysis

Date Collected:	4/23/2014	Group:	A
System ID No:	IH3826	System Name:	7 Cedars Casino
Lab - Sample #:	01022401	County:	Clallam
Sample Location:	Enterprise Lane	DOH Source No:	
Sample Purpose:	I	Date Received:	4/23/2014
Sample Composition:	S	Date Analyzed:	4/23/2014
Send Report To:	Rich Camporini 1033 Old Blyn Hwy Sequim, WA 98382	Date Reported:	5/6/2014
		Sample Type:	Pre-treatment/Raw
		Collected By:	Rich Camporini
		Phone Number:	360-460-9484
		Bill To:	Jeff Becker Jamestown S'Klallam Tribe 1033 Old Blyn Hwy Sequim, WA 98382

DOH#	Analyte	Results	Units	SRL	Trigger	MCL*	MCL Exceeded	Method (Analyst Init.)

SRL: (State Reporting Level), indicates the minimum reporting level required by the Washington Department of Health (DOH).

Trigger Level: DOH Drinking Water response level. Systems with compounds detected at concentrations in excess of this level are required to take additional samples. Contact your regional DOH office for further information.

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< (0.00x): indicates the compound was not detected in the sample at or above the concentration indicated.

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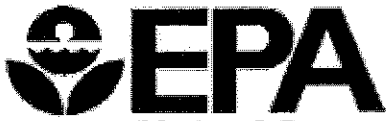
Appendix D: EPA Well Cap and Casing Extension Guidance for Enterprise Lane Well

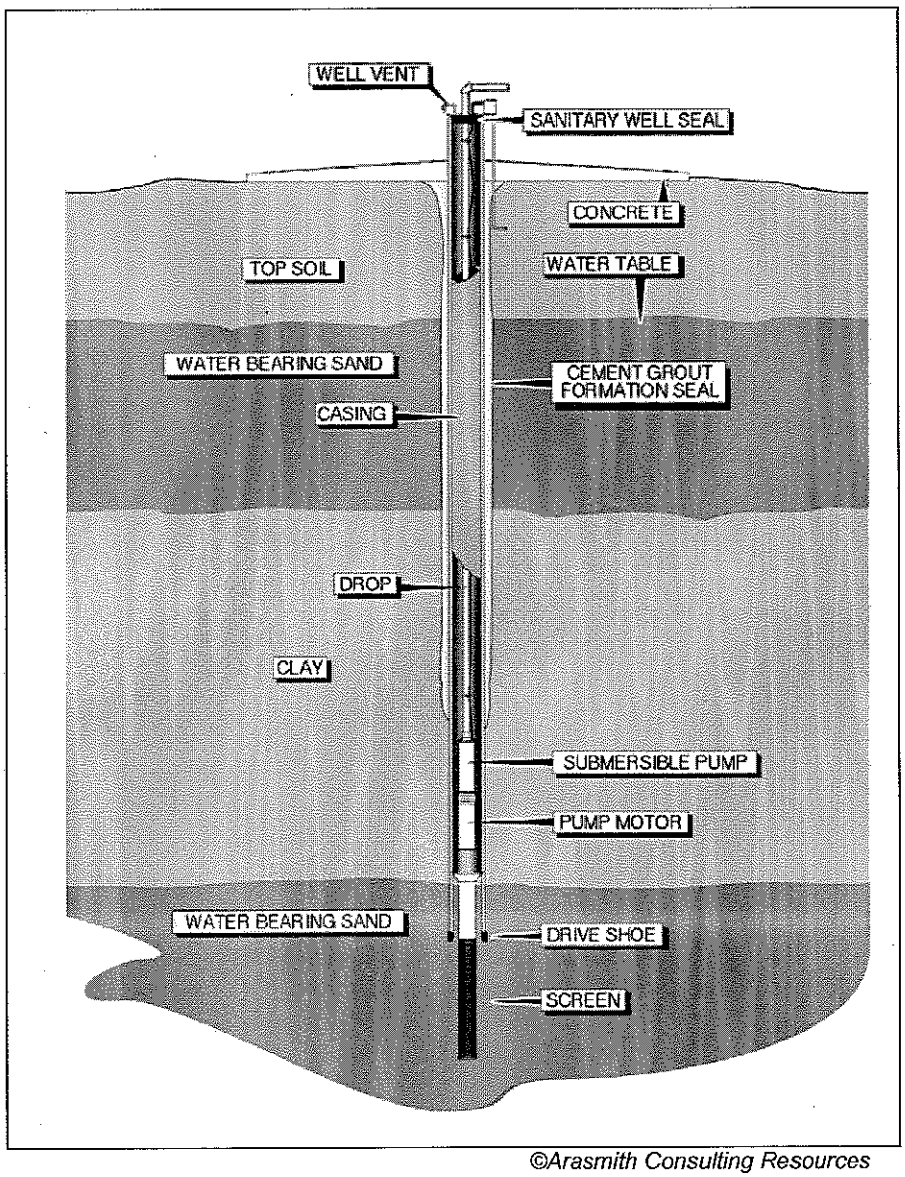


United States
Environmental Protection
Agency

SANITARY SURVEY GUIDANCE MANUAL FOR GROUND WATER SYSTEMS

saturated zone, the area in which all interconnected spaces in rocks and soil are filled with water, and pumps are used to withdraw water to be distributed. A major concern in the design of a well is preventing contaminants from entering the aquifer. The major components of a typical groundwater well are shown in Exhibit 4.1.

Exhibit 4.1 Major Components of a Typical Groundwater Well



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(Source: UFTREEO Center, 1998; Used with permission)

Although there are many well drilling techniques, a well is started by drilling a hole in the ground into an aquifer. The drilled hole is supported by solid casing installed to the top of the well screen. The well casing is usually made of steel or polyvinyl chloride (PVC). It should have walls thick enough to meet collapse strength requirements for its use (Recommended Standards for Water Works, 2007). PVC casing is not recommended at locations where there is a

chance that the overlying soil contains hydrocarbons that could permeate the casing and contaminate the deeper water being used.

A well screen is installed below the casing to allow water into the casing while preventing the migration of sand and silt into the bottom of the well. The screen should be constructed of corrosion resistant material that is both strong and hydraulically efficient. The screen's mesh size should be determined based on a sieve analysis of the formation or gravel pack materials. The screen should be installed so the pumping water level remains above the screen under all operating conditions (Recommended Standards for Water Works, 2007).

Wells are often equipped with submersible pumps and discharge lines that reach down inside the casing into the water. Some wells have a lineshaft turbine pump mounted on top of their casings. Depending on the type of well pump being used, the casing will look different and will be equipped with different kinds of seals and vents. These differences and their potential deficiencies are described in more detail in section 4.2.1.1.

The well casing is usually surrounded by 1 to 2 inches of neat cement or cement grout. The grout fills the annular opening between the casing's exterior and the edge of the hole drilled in the ground. Ideally, the annular opening should be large enough to allow a minimum of 1½ inches of grout around the casing.

Many States have standards or guidelines for existing and/or newly constructed wells. The surveyor should follow the State's standards when inspecting wells.

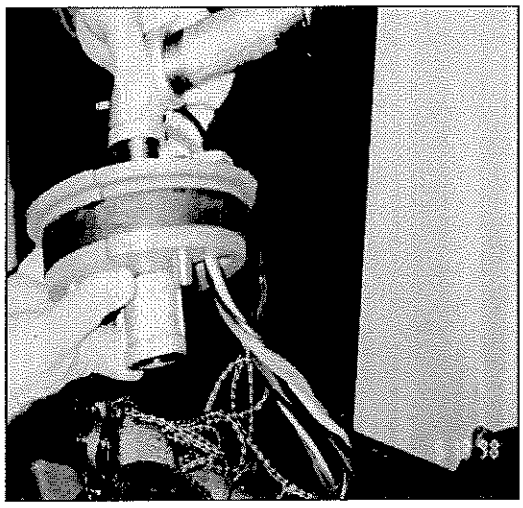
4.2.1.1 Surface Features

The well casing should extend at least 18 inches above the pump house floor and ground surface. If the location of the well is prone to flooding, the casing and its vent should extend high enough so they are not submerged during a flood. At locations prone to flooding, a PWS should ensure the top of the casing stands at least 3 feet above the 100 year flood level or the highest known flood elevation (whichever is higher) (USEPA, 2003a).

Wells with submersible pumps should be capped and the cap should be sealed so no water or contamination can enter the well. Seals should fit properly to accommodate all well appurtenances. If the well is not housed, the well cap should be locked and lightning protection should be provided.

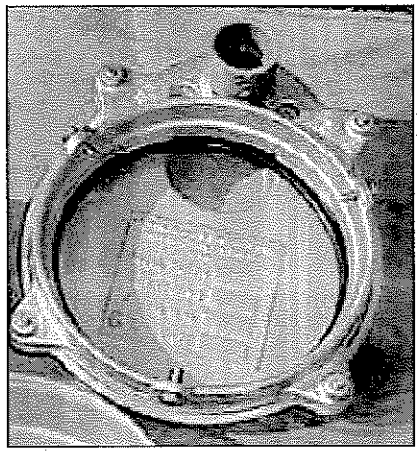
One type of well seal used with submersible turbine pumps is a sanitary well seal with an expandable gasket to allow the pump drop pipe, wires and vent to pass through it. This type of seal, shown in Exhibit 4.2, is typically used in wells housed in a well house. Bolts tighten two plates together, expanding the gasket material located between the plates. It seals the openings around the casing, pump drop pipe, the inverted U-type screen vent, and the electrical conduit.

Exhibit 4.2 Illustrations of a Split Cap and Seal



The other type of seal is an overlapping exterior sanitary well seal, illustrated in Exhibit 4.3. It is commonly used in outdoor applications with submersible pumps and pitless adapter units. The vent is under the lip, and gasket material seals all openings around the casing and conduit.

Exhibit 4.3 An Overlapping Exterior Sanitary Well Seal



Wells with a lineshaft turbine pump mounted on top of the casing should have a metal support plate on which a rubber gasket is mounted to provide a sanitary seal. The motor, along with an attached column and discharge head, is mounted on top of the gasket and support plate. During the sanitary survey, this kind of well should be checked to ensure there is a rubber gasket providing a sanitary seal and that the gasket is in good condition. Exhibit 4.4 illustrates the top of a casing for a well with a lineshaft turbine pump and the top of a casing for a well with a submersible turbine pump and a split cap.

Appendix E: April 2014 Site Visit Photographs

Eco Smarte treatment system controls

Eco Smarte Treatment system, inline copper electrodes shown

Potassium permanganate chemical injection

Enterprise Lane well house

Enterprise Lane well head and controls

Well cap lacks screened vent. Well cap must be fitted with a screened vent to meet EPA standards.

Casing is too short. Casing must be extended to a minimum of 18 inches above the slab to meet EPA standards.